

## CLAIMS

1. A radio communication apparatus comprising:  
directivity switching determining means for  
determining whether to change a directivity or beam  
width of transmission array antenna based on a  
channel situation obtained when a radio signal is  
received; and

antenna controlling means for controlling a  
transmission directivity to transmit/retransmit a  
signal according to a determination result of said  
directivity switching determining means.

2. The radio communication apparatus according  
to claim 1, wherein said directivity switching  
determining means orients a directivity of the  
transmission antenna toward waves other than a main  
wave when the channel situation is poor.

3. The radio communication apparatus according  
to claim 1, wherein said directivity switching  
determining means outputs an information to widen  
the beam width of the transmission antenna  
directivity when the channel situation is poor.

4. The radio communication apparatus according  
to claim 1, wherein said directivity switching  
determining means outputs an information to narrow  
the beam width of the transmission antenna  
directivity when the channel situation is good.

5. The radio communication apparatus according  
to claim 3, wherein said directivity switching

determining means measures a level of the channel situation and changes the beam width gradually in accordance with said level.

6. The radio communication apparatus according to claim 3, wherein said directivity switching determining means provides a limitation on changing the directivity or beam width of transmission array antenna.

7. A radio communication apparatus comprising:  
10 estimating means for estimating a channel situation obtained from a received radio signal and output reception quality information; and

directivity switching determining means for determining whether to change a directivity or beam  
15 width of transmission array antenna based on said reception quality information using a control signal that indicates a change in a transmission directivity.

8. A second radio communication apparatus that  
20 comprises antenna controlling means for controlling a transmission directivity to transmit/retransmit a signal in accordance with an information of a control signal transmitted from a first radio communication apparatus, wherein said first radio  
25 communication apparatus comprises estimating means for estimating a channel situation obtained when the signal is received and to output reception quality information, and directivity switching determining

means for determining whether to change a directivity or beam width of transmission array antenna based on said reception quality information and to transmit a control signal that indicates a change in a transmission directivity.

9. The second radio communication apparatus according to claim 8, wherein said directivity switching determining means orients a directivity of the transmission antenna toward waves other than a main wave when the channel situation is poor.

10. The second radio communication apparatus according to claim 8, wherein said directivity switching determining means outputs an information to widen the beam width of the transmission antenna directivity when the channel situation is poor.

11. The second radio communication apparatus according to claim 8, wherein said directivity switching determining means outputs an information to narrow the beam width of the transmission antenna directivity when the channel situation is good.

12. The second radio communication apparatus according to claim 10, wherein said directivity switching determining means measures a level of the channel situation and changes the beam width gradually in accordance with said level.

13. The second radio communication apparatus according to claim 10, wherein said directivity switching determining means provides a limitation

on changing the directivity or beam width of transmission array antenna.

14. A base station apparatus comprising a radio communication apparatus wherein said radio communication apparatus comprising directivity switching determining means for determining whether to change a directivity or beam width of transmission array antenna based on a channel situation obtained when a partner radio communication apparatus on a receiver side receives a signal, and antenna controlling means for controlling a transmission directivity to transmit/ retransmit the signal in accordance with a determination result of said directivity switching determining means.

15. A communication terminal comprising a radio communication apparatus wherein said radio communication apparatus comprising directivity switching determining means for determining whether to change a directivity or beam width of transmission array antenna based on a channel situation obtained when a partner radio communication apparatus on a receiver side receives a signal, and antenna controlling means for controlling a transmission directivity to transmit/retransmit the signal in accordance with a determination result of said directivity switching determining means.

16. A base station apparatus comprising a radio communication apparatus wherein said radio

communication apparatus comprising estimating means for estimating a channel situation obtained when the signal is received and output reception quality information, and directivity switching determining means for determining whether to change a directivity or beam width of transmission array antenna based on said reception quality information and to transmit a control signal that indicates a change in a transmission directivity.

10           17. A communication terminal apparatus comprising a radio communication apparatus wherein said radio communication apparatus comprises antenna controlling means for controlling a transmission directivity to transmit/ retransmit a  
15 signal in accordance with an information of a control signal transmitted from a partner radio communication apparatus on a receiver side.

18. A radio communication method comprising:  
the directivity switching determining step of  
20 determining whether to change a directivity or beam width of transmission array antenna based on a channel situation of a signal that a communication partner has received; and

the antenna controlling step of controlling a  
25 transmission directivity in accordance with a determination result of said directivity switching determining step.

19. A radio communication method comprising:

at a receiver side, the estimating step of estimating a channel situation ;

the directivity switching determining step of determining whether to change a directivity or beam  
5 width of transmission array antenna based on said reception quality information that indicates a change in a transmission directivity, and

at a transmitter side, the antenna controlling  
10 step of controlling the directivity of transmission antenna or the beam width in accordance with the information to change the directivity or beam width transmitted from a radio communication apparatus on the receiver side.

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